

2010 Chief of Naval Operations Environmental Award
Environmental Sustainability – Team
Fleet Readiness Center Southeast (FRCSE)

INTRODUCTION

Mission: Fleet Readiness Center Southeast (FRCSE) is one of eight Fleet Readiness Centers devoted to maintenance, repair and overhaul of naval aircraft, engines and aeronautical components. FRCSE is a full spectrum aircraft maintenance operation, possessing all of the key capabilities required to maintain high-performance tactical aircraft. Capabilities include comprehensive in-service engineering and logistics services for support of assigned air vehicles, engines and weapons systems. During Fiscal Year (FY) 10, FRCSE returned 75 aircraft to the Fleet including: 12 P-3 Orion Antisubmarine Patrol Aircraft; 24 F/A-18 Hornet Aircraft; 12 EA-6B Prowler Aircraft, 26 H-60 Seahawk Helicopter, and 1 S3 Aircraft. During the period, FRCSE also returned 1,056 repairable engine components, assemblies, and accessory units to the Fleet. These included: 30 F414 engines and 967 F414 engine modules, 31 J52 engines and 28 TF34 engines. Finally, FRCSE also repaired nearly 30,000 components. These components received repair for structural mechanical, avionics and engine component programs.

Environmental, Geographic and Community Setting: FRCSE is the largest tenant command on Naval Air Station Jacksonville (NAS Jax) and the largest industrial employer in Northeast Florida and Southeast Georgia, and is located within Florida Environmental Protection Agency (EPA) Region 4. FRCSE has more than 4,000 employees representing 118 trades and occupations. FRCSE covers 127 acres and occupies 70 buildings with more than 2.5 million square feet of industrial, office and warehouse space. FRCSE lies within the City of Jacksonville and borders the St. Johns River. The St. Johns River empties into the Atlantic Ocean just north of Jacksonville and is designated an American Heritage River by the EPA to ensure natural resource protection, as well as economic, historic and cultural preservation.

PROGRAM MANAGEMENT/BACKGROUND

Environmental Aspects and Challenges: In support of its Navy mission, FRCSE operates many industrial processes that present substantial environmental challenges. Significant environmental aspects are associated with chemical and mechanical paint removal, painting, chemical cleaning and degreasing, machining, composite repair, non-destructive testing, heat treating, foundry and jet engine testing. Other environmental aspects are associated with repair and test of electronic systems, oxygen systems, hydraulic and fuel systems as well as reassembly and test of aircraft. FRCSE also operates two industrial waste water treatment plants which generate significant waste streams. Still other environmental aspects are associated with the upgrade of industrial facilities and processes, disposal of excess equipment as well as maintenance of ground support equipment. Package, preservation and transportation of products and services also factor in the environmental footprint. Finally, to maintain operations, various service contracts as well as public works department support is required. In summary, there are many challenges but also many opportunities to reduce the amount of energy, water and material resources consumed and waste generated by FRCSE.

Organization and Management: FRCSE considers environmental stewardship to be of equal importance to productivity, quality and safety and a business imperative to mission sustainment. To support this business decision, FRCSE maintains an externally certified ISO 14001:2004 Environmental Management System (EMS) program and drives its program by the Environmental Policy Statement signed by the Commanding Officer. Adherence to the elements of the ISO standard ensure that all significant aspects are identified and appropriate EMS objectives, targets and programs

are planned and executed. FRCSE is also committed to mission sustainment at least cost while meeting the goals of Executive Order (EO) 13423 and the more recent EO 13514 (Federal Leadership in Environmental, Energy and Economic Performance) and has integrated these goals as a priority of its EMS program. The EMS program is managed by the Environmental Director with a staff of 22 professional and technical personnel who are responsible for Environmental Compliance, Environmental Operations and Environmental Quality. To provide top quality services and continuous improvement, the environmental team coordinates closely with internal stakeholders from production, safety, engineering and logistics, along with external stakeholders from the NAS Jax Environmental Office, City of Jacksonville Environmental Resource Department, the Florida Department of Environmental Protection and the public and business community of Northeast Florida.

The EMS program is supported by a working level EMS and Pollution Prevention (P2) team as well as a senior level Executive EMS/P2 Committee. The Executive EMS/P2 committee meets quarterly to review performance and provide resource support to the EMS and P2 programs. The Executive EMS/P2 Committee includes senior representatives from the environmental office, engineering, strategic business teams as well as various support organizations. In a similar manner, the working level EMS/P2 team includes representatives from these key groups plus the energy manager, safety office representative and environmental managers for Air, Hazardous Material (HM) and Waste. Environmental representatives from NAS Jax are also a part of the team. The EMS/P2 team is co-chaired by the EMS and P2 managers. All EMS documentation is maintained on the FRCSE environmental website to ensure all employees, contractors and military personnel are aware of the Environmental Policy, the elements of the EMS Program, as well as current objectives, targets and programs.

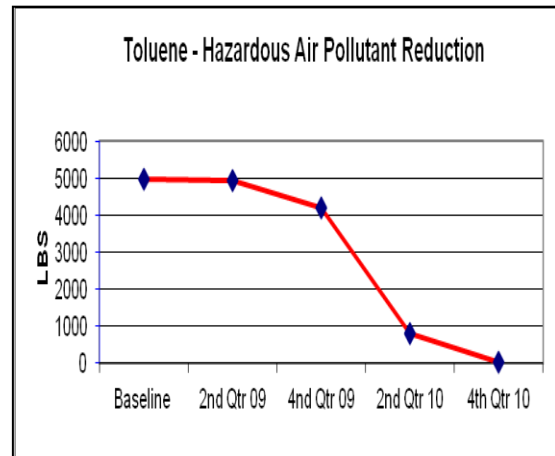
FRCSE fully appreciates the plan-do-check-improve cycle of the ISO standard and considers regular, scheduled environmental reviews of its program to be vital to continuous improvement. Accordingly, internal and external compliance audits as well as EMS management reviews are managed as opportunities to improve the environmental program. To meet the ISO standard, EMS management reviews are conducted semi-annually and include a review of EMS program performance in terms of mission benefits and cost savings. It also includes a review of compliance audits, environmental success stories and discussions relative to future business workload, regulatory changes and environmental priorities to maintain environmental compliance and sustain the mission at lowest cost.

Awards and Services:

2010 Joint Depot Maintenance Excellence Award
2010 Shingo Bronze Medallion - TSRS Shop
2010 State Commissioner's Business Recognition Award
2009/10 NAVAIR and CNO Aviation Safety Awards
2009 Florida Manufacturer of the Year
2008 Chief of Naval Operations (CNO) Pollution Prevention (P2) Team Award
2008 Secretary of the Navy (SECNAV) (P2) Team Award
2008 Honorable Mention in Secretary of Defense P2 Team Award Category

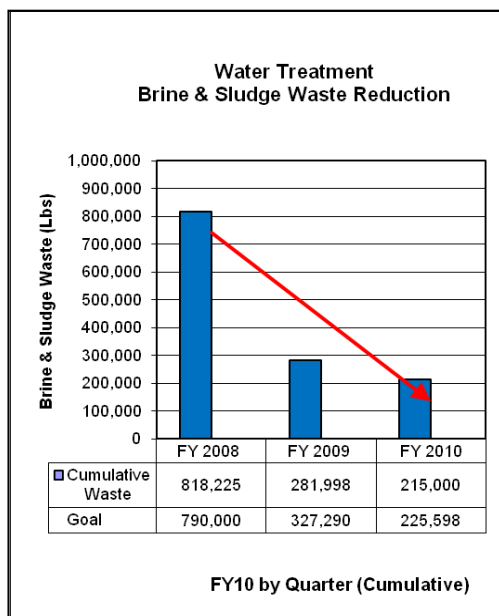
TECHNICAL MERITS/ACCOMPLISHMENTS

Material Substitution: The FRCSE Solvent Substitution Team received high praise from NAS Jax commanding officer and Commander, Fleet Readiness Center (COMFRC) for improving air quality and reducing ground-level ozone (smog) by eliminating more than 2.5 tons of the hazardous air pollutants from the industrial facility's manufacturing processes. This result was achieved by eliminating more than 700 gallons of toluene, a toxic release inventory solvent regulated under the Resource Conservation and Recovery Act. The toluene reduction was achieved by implementing less hazardous, more earth-friendly solvents, such as Isopropyl Alcohol, DS-108 Cleaner, Teksol EP Cleaner, Tert Butyl Acetate Wipes, BioAct 105 Wipes and SkyKleen 1000 Aviation Solvent which is biodegradable.



Process Modification or Improvement: FRCSE operates two industrial waste water treatment plants in support of electroplating, cleaning, non-destructive inspection, painting, de-painting and surface finishing operations. These waste water treatment facilities consume significant quantities of raw materials and energy and generate high quantities of hazardous brine and sludge waste. As a result of these environmental aspects, the FRCSE established a set of aggressive objectives, targets and programs to reduce the amount of waste treated and discharged from these plants. Working together

with treatment plant managers, production, material engineer, process engineers, and the environmental office, FRCSE targeted point source waste streams for reduction, implemented more cost effective operating procedures for water treatment, and leveraged existing capabilities of Naval Facilities Public Works Department for final water treatment. As a result of this effort, FRCSE reduced the total amount of hazardous waste by 62 percent or more than 600,000 pounds per year, avoided more than \$480,000 in annual disposal cost and greatly reduced the overall cost of industrial water treatment.



As a further result of this EMS effort, a procurement strategy was developed to replace the current, aging treatment plants with the latest, high efficient waste treatment technologies that incorporate water reuse wherever possible. Replacement of the treatment plants is scheduled to complete over the next two years in a phased approach to maintain

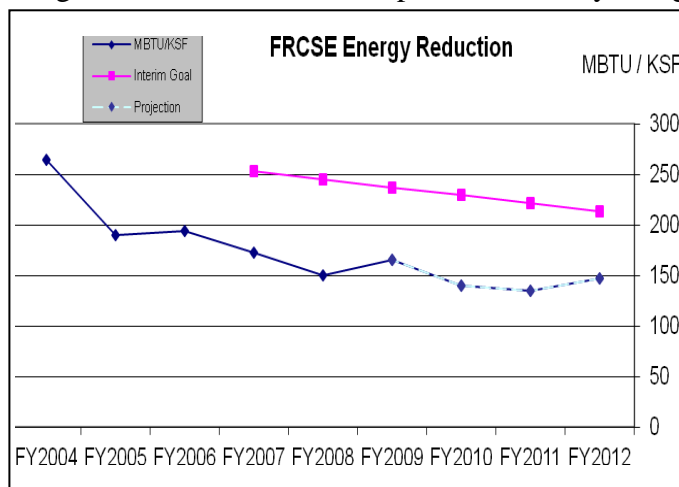
production capability. While current operating cost is \$2.25 million per year, treatment plant modernization operating cost is expected to be reduced to less than \$750,000 per year and result in a cost avoidance of more than \$1.7 million annually.

Improved Material Management: FRCSE is employing best management practices by establishing an aggressive EMS target to reduce HM waste and HM procurements by 38 percent. Over the past three years, the environment office HM manager, personnel from material supply and production personnel have worked aggressively with materials engineers to reduce the amount of waste associated with HM management. During FY09/10 the team reduced annual HM procurement

cost by nearly \$40,000 and reduced the amount of HM waste by more than 5,400 pounds. The success of this continuing effort has been attributed to a dedicated team and systematic approach to gain visibility of the issues, employ best management practices and obtain approval to extend the shelf life of materials where possible. During FY09/10 the team reduced annual HM procurement cost by nearly \$40,000 and reduced the amount of HM waste by more than 5,426 pounds. Further savings will be realized through a reduction of labor as a result of hazardous material management process improvements.

Compliance with Executive Order (EO) 13423 and EO13514: FRCSE continues to make significant progress toward the goals of EO13423 and EO 13514, specifically in regard to Environmental, Energy and Economic performance as it affects Mission Sustainment.

Energy Performance: FRCSE has been highly successful in addressing energy and utility conservation in all phases of its work and is exceeding the 3 percent per year reduction mandated by EO 13423 and EO 13514. As of 2009, FRCSE reduced energy consumption by 104 Million British Thermal Units (MBTU) per thousand square feet (KSF) to provide a 38 percent energy reduction from the 2003 baseline. The Energy Manager attributes this success to a close partnership with Naval Facilities (NAVFAC) for more than 20 years. During this time, FRCSE has implemented many energy conservation projects and collaborated on larger base and regional conservation efforts including Naval Air Station Steam Decentralization Project and Service Air Improvement Projects. In addition, industrial process engineers regularly review their processes for ways to reduce energy, water and compressed air use through industrial equipment acquisition projects and LEAN/Six Sigma initiatives. For example, older machines are targeted for replacement with energy saving components and control systems including high-efficiency motors and digital control systems for high-speed lathes, milling machines and other equipment. In addition, facility engineers have been instrumental in developing and integrating energy and utility savings initiatives into facility and space rehabilitation and Heating Ventilation Air Conditioning (HVAC) projects.



During FY09, FRCSE installed High-Bay Lighting project to reduce energy consumption by 5,065 MBTU/year, reduce Green House Gas (GHG) by 763 tons/year (Carbon Dioxide, CO₂) and provide an annual cost avoidance of \$89,700. During FY10, FRCSE installed Hangar 101W High-Bay Infrared Heating System installation to reduce energy by 1,540 MBTU/year, reduce GHG by 294 tons/year (CO₂) and deliver an annual cost avoidance of \$281,000/year. Currently, FRCSE is partnering with Chief of Naval Installation Southeast and NAVFAC Southeast to develop renewable and alternative energy sources to meet the EO requirement for on-site energy generation and environmental sustainability. Projects being proposed include thermal solar, photovoltaic and fuel cell energy sources and installation of Light Emitting Diode (LED) based exterior lighting systems on FRCSE buildings.

Environmental and Economic Performance: Highlights of FRCSE environmental, energy and economic performance during the period is captured in the table below which lists the projects that support the EO 13423, 13513 and mission sustainment at reduced cost.

Active, Complete and Planned Projects				
Project Description	Status	Performance		
		Economic	Energy and Environment	Stakeholder Relations
Removal of Underground Storage Tanks	Complete FY09	Sustainability Improvement	Compliance and prevention of soil and groundwater contamination	
Establish Corn Starch Blast Production Capability	Complete FY09	Sustainability Improvement	Green procurement and elimination of chemical paint strip for thin structures	
Mandatory reporting of GHG emissions	Complete FY09/10	Sustainability Investment	Compliance and Operational Transparency (FRCSE is below reporting threshold)	
Improve F-18 Fuel Cavity Leak Check Process	Complete FY10	\$30,000/year avoidance	Waste reduction, Water conservation (600 gallons/aircraft) and labor saving (12 hour/ac)	
Implement use of machine coolant maintenance unit	Complete FY10	\$1.4 million /year avoidance	Filter and recycle coolants to reduce coolant purchase and waste generated by 225,000 pounds/year	
Establish utility, vehicle pools and replacement policy	Complete FY10	Sustainability Improvement	Improve transportation efficiency, reduce cost; reduce fossil fuel dependency	
Install high efficiency lighting throughout FRCSE	Complete FY09	\$89,700/year avoidance	Reduce Energy use by 5,065 MBTU/year; reduce Green House Gas (GHG) 763 tons (CO2)	
Install IR Heating for P-3 hangar (B-101W)	Complete CY10	\$281,000/yr avoidance	Reduce Energy use by 1,540 MBTU/year; reduce GHG 294 tons (CO2)	
Replace B-140 HVAC and replace windows B101W	Planned FY11	\$220,136/yr avoidance	Reduce Energy use by 6,869 MBTU/year; reduce GHG 940 tons (CO2)	
Chrome Plating and Scrubber Interlock	Complete FY09	\$117,000/yr avoidance	Improve environmental control and compliance; Reduce labor	
Improve Material Shelf Life Management	Active FY09/10	\$40,000 avoidance	Reduce hazardous material purchase by 5,400 pounds; Reduce waste	
Building Condition and HVAC and Controls Audit	Complete FY10	Sustainability Improvement	Improve building and HVAC systems to conserve water and energy	
Purchase Solvent Recycler for Aircraft paint	Active ECD FY11	\$25,000/yr avoidance	Reduce material procurement, reduce waste, improve efficiency, reduce cost	
Identify better performing Machine Coolants	Active ECD FY11	\$300,000/yr avoidance	Reduce material procurement, reduce waste, improve efficiency, reduce cost	
Implement Pressure Drop Test for F/A-18 fuel cells	Complete FY10	Sustainability Improvement	Reduce waste due to rework of fuel cells; Reduce associated labor and A/C TAT by 5 days	
Reuse JP-5 waste from low point drains to fuel GSE	Complete FY10	\$50,000/yr avoidance	Eliminate procurement of diesel fuel for GSE	
Reclaim 1010 used to preserve A/C fuel systems	Active ECD FY11	\$60,000/yr avoidance	Reduce procurement of new 1010 oil and eliminate unnecessary waste	
Install electrical use meters FRCSE power grid	Complete FY10	Sustainability Improvement	Reduce Energy consumption by installing meters to measure actual use and monitor to goal	
Install Drum Washer to clean containers and drums	Active ECD FY11	\$64,000/yr avoidance	Reduce water use more than 34,000 gallons/year associated wastewater treatment cost	

Recycle Program: During FY09/10 FRCSE reclaimed 13 EA-6B Prowler aircraft, recovering about 300 parts from each stricken aircraft and providing a cost avoidance of about \$9 million to the Navy and taxpayer. This accomplishment was achieved thanks to the Navy's Stricken Aircraft Reclamation and Disposal Program (SARDIP) which is funded by Naval Inventory Control Point (NAVICP). Under this program badly damaged aircraft or those at the end of their service life are

returned to FRCSE where the valuable parts were harvested and recycled back to the Fleet. Recycled components or in some cases whole sections, such as the cockpit enclosure or the wings are re-used for Planned Maintenance Intervals (PMI) or for repairs with the remainder sent to the Navy's supply system as readiness-based spares. Stricken aircraft are demilitarized, its parts reclaimed and recycled to the Fleet. In summary, for every dollar spent to salvage the Prowler's reusable items, the Navy recovers nearly \$113 worth of materials and improves mission as well as environmental sustainability as none of the aircraft goes to a landfill.

In support of NAVAIR's Reclamation Pilot Program (RPP) and the General Electric (GE) Rhenium Reduction Plan, FRCSE completed contract modification with GE in June 2009 to begin recycling rhenium, a rare earth metal, back to GE. To date, FRCSE has recycled more than 30 tons of demilitarized, turbine blades back to GE for rhenium extraction and remanufacture of turbine blades. This effort conserves precious natural resources and supports mission sustainment at least cost.

FRCSE continues to champion recycling in every area to minimize impact to natural resources, reduce cost and reduce amount of waste to landfill. During FY09 FRCSE increased the amount of recycled plastics and cans by providing more containers, more collection sites and improving signage. During FY10 FRCSE implemented a cost-neutral pilot program to recycle more than 130,000 pounds of cardboard. Currently, FRCSE is planning to expand its recycling efforts to include wood shipping crates and wood pallets.

During FY09/10, FRCSE diverted nearly 241 tons of material from landfill to avoid \$462,000 in disposal cost. This includes the following recycled materials: Bottles/cans 3,600 pounds; Newspaper 3,280 pounds; Office paper 33,500 pounds; Cardboard 260,000 pounds; Metals 1.6 million pounds; Lead acid batteries 32,700 pounds; Rubber 19,300 pounds; Plastic 1,100 pounds; Used oil 483,188 pounds (Energy Recovery); Used JP-5 7.7 million pounds. In addition, FRCSE saved nearly \$2.73 million through reuse of JP-5 fuel. FRCSE also recycled the following universal waste items: Lamps 6,348 pounds; Lead acid batteries 689 pounds; and Sealed batteries 838 pounds.

ORIENTATION TO MISSION

EMS Program: FRCSE considers environmental stewardship to be a business imperative to Fleet sustainment. Therefore, in concert with the requirement of the EO 13514 and the DoD Strategic Performance Plan, FRCSE is committed to maintaining ISO 14001 certification and adhering to the elements of the standard as a means to ensure visibility of all environmental aspects of the organization and to ensure all significant environmental aspects of its process activities are identified and programs are implemented to conserve resources, reduce waste and ensure environmental compliance.

Continuous Improvement: FRCSE considers continuous improvement as vital to its future and key to Mission Sustainability at least cost. To that end, FRCSE is fully committed to both internal and external reviews of its EMS program against the ISO 14001 as well as Quality Management System requirements of ISO 9001:2000 and AS9100:2004. Accordingly, FRCSE maintains a continuous improvement database to record discrepancies and ensure root-cause analysis is performed prior to closure of every finding. In addition, the environmental office supports more than 34 environmental shop assist visits each year to ensure environmental compliance, improve relationships with strategic business teams and identify pollution prevention opportunities. In every area, FRCSE views audit findings as an opportunity to improve environmental compliance at reduced cost.

Environmental Training: FRCSE is fully committed to employee environmental training to ensure compliance, reduce pollution and ensure continuous improvement. General environmental

awareness training is provided to all new employees and is reinforced through an innovative web-based training system tailored to employee job function. In addition, all production personnel are required to complete specific, shop level environmental awareness training lead by their immediate supervisor. Finally, FRCSE rewards employees for their environmental stewardship through recognition in the Environmental Pacesetter of the Quarter Program.

TRANSFERABILITY

NAVFAC leads major facility improvements to incorporate the latest energy and water efficiency designs and incorporate those designs into FRCSE facilities. Oversight is provided by the Resource Efficiency Manager in concert with the FRCSE energy manager to ensure acceptable design and mission sustainment at least cost. Industrial process engineers regularly review their processes for ways to reduce energy, water and compressed air consumption, and incorporate these measures as part of their LEAN/Six Sigma initiatives and industrial equipment acquisition projects.

FRCSE is fully committed to finding technology and material solutions to solve environmental issues common to the Navy and DoD. To this end, several FRCSE materials engineers are fully engaged with Environmental Strategic Technology Certification Program (ESTCP) as well as Strategic Environmental Research and Development Program (SERDP) and many other development programs to support naval aviation needs. Currently, FRCSE is supporting the following mission sustainment initiatives: (1) High Velocity Oxygen Fuel and nano-crystalline cobalt-phosphorus (nCoP) coatings technologies as replacements for chrome plating, (2) zinc nickel alternative to cadmium plating and (3) hydrofluoroether (HFE) and BrulenTM solvent alternatives to chlorofluorocarbon (CFC) for aviation oxygen cleaning. FRCSE materials engineers have approved trivalent chromium post treatment of anodize processes and are also working with industry and the rest of the DoD to find alternatives to hexavalent chrome metal treatments as well as non-chromate primers.

As a member of the First Coast Manufacturers Association, FRCSE continues to develop relationships with FCMA members that lead to integrating not only the latest concepts for Lean Manufacturing but also implementing the latest P2 and resource conservation technologies.

STAKEHOLDER INTERACTION/ EDUCATION, OUTREACH and PARTNERING

The FRCSE EMS team works effectively with stakeholders and the community of northeast Florida. The team of environmental media managers and representatives from NAVFAC Environmental, strategic business teams, Fleet personnel, aviation and industrial engineers, energy and water manager as well as occupational safety and health and logistics personnel work closely with the base environmental office, NAVFAC, the City of Jacksonville and Florida Department of Environmental Protection (FDEP) to ensure compliance, reduce pollution and provide continuous improvement.

FRCSE is a charter member of the Northeast Florida Environmental Compliance Partnering Team. This team includes environmental professionals from the Navy, City of Jacksonville, and the FDEP and promotes understanding of member missions and provides proactive resolution of compliance and permitting issues to ensure environmental protection of Jacksonville and northeast Florida. In collaboration with NAS Jax, Naval Station Mayport and the City of Jacksonville, FRCSE supports annual Earth Day celebrations as well as the annual clean up of the St. Johns River campaign. Typically, the Navy sets up an Earth Day booth at the Jacksonville Landing to foster community relationships and understanding of Navy operations and Navy actions to reduce environmental impact. In a similar manner, FRCSE supports the annual campaign to clean up the St. Johns River and works side-by-side with community members and local organizations.